**IN THE UNITED STATES DISTRICT COURT**
**FOR THE WESTERN DISTRICT OF TEXAS**
**WACO DIVISION**

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|---|---|
| ANCORA TECHNOLOGIES, INC.<br><br>Plaintiff,<br><br>v.<br><br>LG ELECTRONICS INC., and LG ELECTRONICS U.S.A., INC.,<br><br>Defendants. | Civil Action No. 2:19-cv-384<br><br>Jury Trial Requested |

## COMPLAINT FOR PATENT INFRINGEMENT

This is an action for patent infringement in which Ancora Technologies, Inc. makes the following allegations against LG Electronics Inc., and LG Electronics U.S.A., Inc. (collectively, "LGE"):

## RELATED CASE

1. This case is related to the action *Ancora Technologies, Inc. v. Samsung Electronics, Co., Ltd., et al.*, filed June 21, 2019, in the United States District Court for the Western District of Texas, Waco Division.

## PARTIES

2. Plaintiff Ancora Technologies, Inc. is a corporation organized and existing under the laws of the State of Delaware with a place of business at 23977 S.E. 10th Street, Sammamish, Washington 98075.

3. Defendant LG Electronics Inc. is a corporation organized and existing under the laws of the Republic of Korea with a principal place of business at LG Twin Towers, 128 Yeoui-daero, Yeongdungpo-gu, Seoul, South Korea.

4. Defendant LG Electronics U.S.A., Inc. is a Delaware corporation with places of business in Texas at least at 9420 Research Blvd, Austin, Texas 78759; 21251-2155 Eagle Parkway, Fort Worth, Texas 76177; and 14901 Beach St, Fort Worth, TX 76177.

5. Further, Defendant LG Electronics U.S.A., Inc. merged with LG Electronics MobileComm U.S.A., Inc., on August 1, 2018, and has stated that it assumed all rights and responsibilities of LG Electronics MobileComm U.S.A., Inc. *3G Licensing S.A., et al. v. LG Electronics, Inc., et al.*, Case No. 1:17-cv-00085-LPS (D. Del.) at Dkt. 144.

6. Defendant LG Electronics U.S.A., Inc. thus is liable for any act for which LG Electronics MobileComm U.S.A., Inc., otherwise would be or would have been liable, including for any infringement alleged in this matter, and references herein to Defendant LG Electronics U.S.A., Inc. should be understood to encompass such acts by LG Electronics MobileComm U.S.A., Inc.

## JURISDICTION AND VENUE

7. This action arises under the patent laws of the United States, Title 35 of the United States Code.

8. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

9. This Court has personal jurisdiction over LG Electronics Inc., and LG Electronics U.S.A., Inc., because, directly or through intermediaries, each has committed acts within the Western District of Texas giving rise to this action and/or has established minimum contacts with the Western District of Texas such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice.

10. For example, on information and belief, Defendants LG Electronics U.S.A., Inc. maintains one or more physical fixed places of business in Texas, including offices at 9420 Research Blvd, Austin, Texas 78759. *See also* https://lgecareers.com/search/?=&businessunit=LG%20Electronics%20USA&spage=2 (last visited June 20, 2019) (listing available LG Electronics USA job positions, including position in Austin, Texas).

11. Further, on information and belief, LG Electronics Inc. directs and controls the actions of LG Electronics U.S.A., Inc. such that it also effectively maintains places of business in Texas, including at 9420 Research Blvd, Austin, Texas 78759.

12. In addition, LG Electronics Inc. and LG Electronics U.S.A., Inc., have placed or contributed to placing infringing products like the LG G5 into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas.

13. On information and belief, LG Electronics Inc., and LG Electronics U.S.A., Inc., also have each derived substantial revenues from infringing acts in the Western District of Texas, including from the sale and use of infringing products like the LG G5.

14. Venue is proper under 28 U.S.C. § 1391(b)-(c) and 28 U.S.C. § 1400.

15. In particular, LG Electronics Inc. is a corporation organized and existing under the laws of the Republic of Korea, and LG Electronics U.S.A., Inc. has maintained a regular and established physical place of business in Austin, Texas, including at least at 9420 Research Blvd, Austin, Texas 78759. *In re HTC Corp.*, 889 F.3d 1349, 1354 (Fed. Cir. 2018); *In re Cray Inc.*, 871 F.3d 1355, 1362-63 (Fed. Cir. 2017).

## THE ASSERTED PATENT

16. This lawsuit asserts causes of action for infringement of United States Patent No. 6,411,941 ("the '941 patent"), which is entitled "Method of Restricting Software Operation Within a License Limitation." A true and correct copy of the '941 patent is attached as Exhibit A.

17. The U.S. Patent and Trademark Office duly and legally issued the '941 patent on June 25, 2002.

18. Subsequent to issue, and at least by December 21, 2004, all right, title, and interest in the '941 patent, including the sole right to sue for any infringement, were assigned to Ancora Technologies, Inc., which has held, and continues to hold, all right, title, and interest in the '941 patent.

19. The president of Ancora Technologies, Inc.—Mr. Miki Mullor—is one of the inventors of the '941 patent.

20. A reexamination certificate to the '941 patent subsequently was issued on June 1, 2010. A true and correct copy of that certificate is attached as Exhibit A.

21. Since being assigned to Ancora Technologies, Inc., the '941 patent has been asserted in patent infringement actions filed against Microsoft Corporation, Dell Incorporated, Hewlett Packard Incorporated, Toshiba America Information Systems, Apple Incorporated, HTC America, Inc., and HTC Corporation.

22. In the course of these litigations, a number of the'941 patent's claim terms have been construed and the validity of the '941 patent has repeatedly been affirmed.

23. For example, in December 2012, the United States District Court for the Northern District of California issued a claim construction order construing the terms (1) "volatile memory"; (2) "non-volatile memory"; (3) "BIOS"; (4) "program"; (5) "license record"; and (6) "verifying the

program using at least the verification structure." *Ancora Techs., Inc. v. Apple Inc.*, No. 11–CV–06357 YGR, 2012 WL 6738761, at *1 (N.D. Cal. Dec. 31, 2012).

24. Further, in its order, the court rejected Apple's indefiniteness arguments and further held that, at least with respect to Claims 1-3 and 5-17, "[t]he steps of the Claim do not need to be performed in the order recited." *Ancora Techs., Inc. v. Apple Inc.*, No. 11–CV–06357 YGR, 2012 WL 6738761, at *5, 13 (N.D. Cal. Dec. 31, 2012).

25. Subsequently, the United States Court of Appeals for the Federal Circuit affirmed the district court's rejection of Apple's indefiniteness argument. *Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 739 (Fed. Cir. 2014).

26. Further, the Federal Circuit agreed with Ancora Technologies, Inc. that "the district court erred in construing 'program' to mean 'a set of instructions for software applications that can be executed by a computer'"—holding that, as Ancora had argued, the term should be accorded its normal meaning of "'a set of instructions' for a computer." *Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 734-35, 737 (Fed. Cir. 2014).

27. Further, in a recent decision, the Federal Circuit again affirmed the validity of the '941 patent—stating: "[W]e conclude that claim 1 of the '941 patent is not directed to an abstract idea." *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343 (Fed. Cir. 2018), *as amended* (Nov. 20, 2018).

28. In addition, the Patent Trial and Appeal Board rejected HTC's request to institute covered business method review proceedings on the '941 patent—explaining that "the '941 patent's solution to the addressed problem is rooted in technology, and thus, is a 'technical solution'" and also rejecting HTC's argument that "the '941 patent recites a technological solution that is not novel and nonobvious." A true and correct copy of this decision is attached as Exhibit B.

**COUNT 1 – INFRINGEMENT**

29. Plaintiff repeats and incorporates by reference each preceding paragraph as if fully set forth herein and further state:

30. LGE has infringed the ’941 patent in violation of 35 U.S.C. § 271(a) by, prior to the expiration of the ’941 patent, selling, and/or offering for sale in the United States, and/or importing into the United States, without authorization, products that are capable of performing at least Claim 1 of the ’941 patent literally or under the doctrine of equivalents and/or, without authorization, causing products to perform each step of at least Claim 1 of the ’941 patent.

31. At a minimum, such Accused Products include those servers/software utilized by LGE to transmit an over-the-air (“OTA”) software update, as well as those smartphones and other devices and technology that received from LGE, or received at LGE’s direction, an OTA update that caused such device to perform the method recited in Claim 1 prior to the expiration of the ’941 patent.

32. Such Accused Products include products like the LG G5, which—as detailed below—is configured by LGE such that it is capable of performing each step of Claim 1 of the ’941 patent and to which LGE provided one or more OTA updates on or about November 21, 2016, November 29, 2016, November 30, 2016, February 20, 2017, and May 17, 2017, that would cause an LG G5 device to perform each step of Claim 1 in order to upgrade its operating system to Android 7.0.[1]

33. Such Accused Products also include products like the LG Aristo, LG Aristo 2, LG Aristo 2 plus, LG Classic, LG D.lite, LG Destiny, LG Eclipse 4G LTE, LG Enact, LG Encompass,

[1] This description of infringement is illustrative and not intended to be an exhaustive or limiting explanation of every manner in which each Accused Product infringes the ’941 patent. Further, on information and belief, the identified functionality of the LG G5 are representative of components and functionality present in all Accused Products.

LG Escape, LG Escape 2, LG Escape 3, LG F90, LG Fiesta, LG Fiesta 2, LG Fortune 2, LG G flex, LG G flex 2, LG G Pad, LG G Pad 10.1 LTE, LG G Pad 7.0 LTE, LG G PAD 8.3, LG G Pad 8.3 LTE, LG G Pad F 7.0, LG G Pad F 8.0, LG G Pad F2 8.0, LG G Pad X 10.1, LG G Pad X 8.0, LG G Pad X 8.0 LTE, LG G Pad X 8.3, LG G Pad X2 8.0, LG G stylo, LG G vista, LG G vista 2, LG G2, LG G3, LG G3 vigor, LG G3(CDMA), LG G4, LG G5, LG G6, LG G6 plus, LG G7 THINQ, LG Grace, LG Harmony, LG Intuition, LG K10, LG K10(4G), LG K11, LG K20, LG K20 plus, LG K20 V, LG K3, LG K30, LG K4, LG K7, LG K8, LG K8+, LG K8V, LG L90, LG Leo LTE, LG Leon C50, LG Leon LTE, LG Logos, LG Lucid 2, LG Lucid 3, LG Lucky, LG Mach, LG Motion 4G, LG Nexus 4, LG Nexus 5, LG Optimus dynamic II, LG Optimus exceed 2, LG Optimus extreme, LG Optimus F3, LG Optimus F3Q, LG Optimus F5, LG Optimus F6, LG Optimus F60, LG Optimus F7, LG Optimus fuel, LG Optimus G pro, LG Optimus L70, LG Optimus L9, LG Optimus L90, LG Optimus plus, LG Optimus regard, LG Optimus select, LG Optimus showtime, LG Optimus Ultimate, LG Optimus zone 2, LG Optimus zone 3, LG Phoenix 2, LG Phoenix 3, LG Phoenix 4, LG Phoenix Plus, LG Power, LG Premier, LG Premier Pro, LG Prime, LG Q6, LG Q7+, LG Realm, LG Rebel, LG Rebel 2, LG Rebel 3, LG Rebel 4, LG Rebel LTE, LG Risio 3, LG Risio cricket, LG Risio LTE, LG Spectrum II, LG Spirit, LG Splendor, LG Stylo 2, LG Stylo 2 Plus, LG Stylo 2 V, LG Stylo 3, LG Stylo 3 LTE, LG Stylo 3 plus, LG Stylo 4, LG Stylus 2, LG Sunrise, LG Sunset, LG Transpyre, LG Treasure LTE, LG Tribute, LG Tribute 2, LG Tribute 5, LG Tribute dynasty, LG Tribute HD, LG Ultimate 2, LG V10, LG V20, LG V30, LG V30 plus, LG Venice, LG Volt, LG Volt 2, LG Wine, LG Wine LTE, LG X charge, LG X power, LG X Style, LG X Venture, LG Xpression Plus, LG Zone 4, to which LGE similarly provided an OTA update prior to the expiration of the ’941 patent.

34. For example, Claim 1 of the '941 patent claims "a method of restricting software operation within a license for use with a computer including an erasable, non-volatile memory area of a BIOS of the computer, and a volatile memory area; the method comprising the steps of: [1] selecting a program residing in the volatile memory, [2] using an agent to set up a verification structure in the erasable, non-volatile memory of the BIOS, the verification structure accommodating data that includes at least one license record, [3] verifying the program using at least the verification structure from the erasable non-volatile memory of the BIOS, and [4] acting on the program according to the verification."

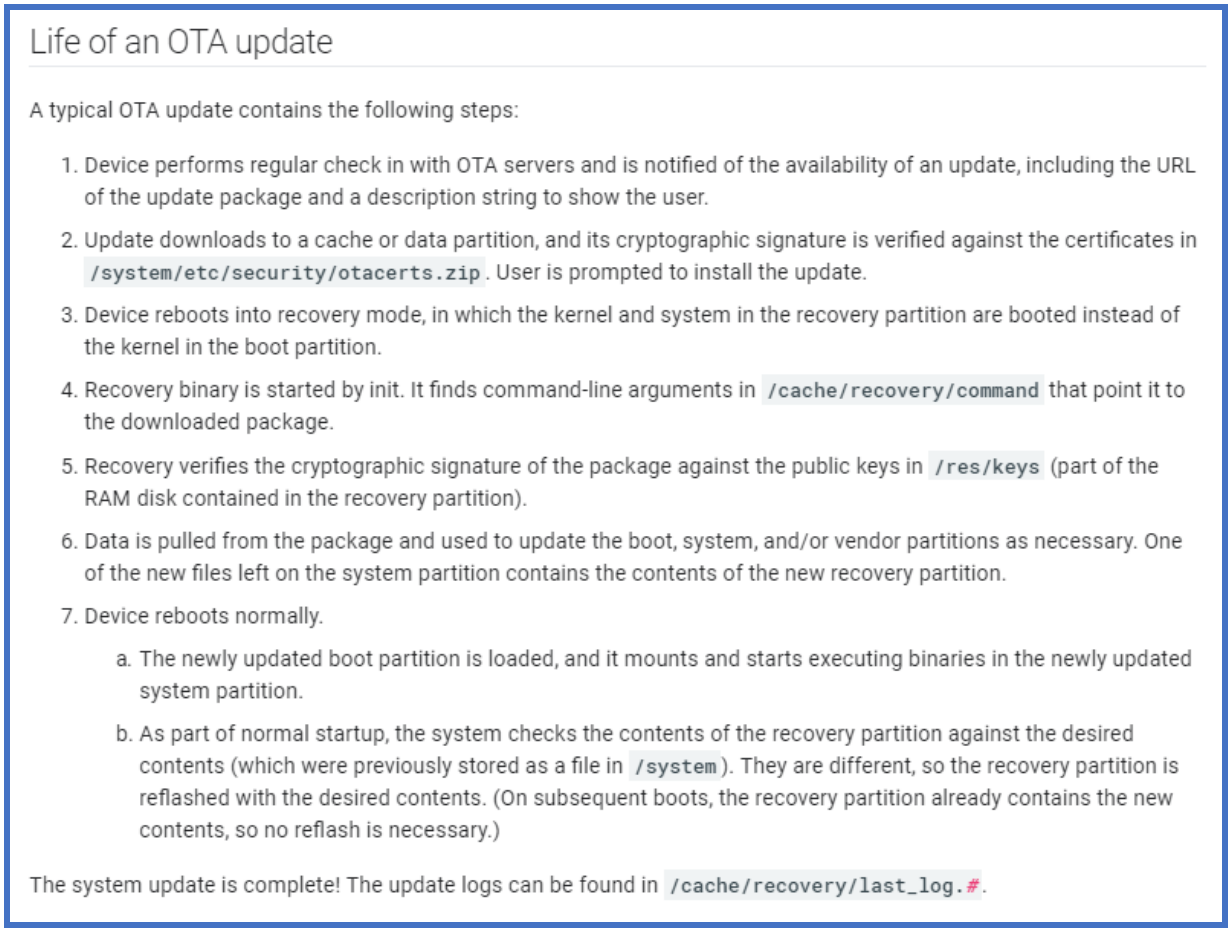
35. When LGE transmitted an OTA update like those it sent on or about on or about November 21, 2016, November 29, 2016, November 30, 2016, February 20, 2017, and May 17, 2017, LGE performed and/or caused to be performed each of these elements as part of what is described as "verified boot":

> Verified Boot
>
> Verified Boot strives to ensure all executed code comes from a trusted source (usually device OEMs), rather than from an attacker or corruption. It establishes a full chain of trust, starting from a hardware-protected root of trust to the bootloader, to the boot partition and other verified partitions including `system`, `vendor`, and optionally `oem` partitions. During device boot up, each stage verifies the integrity and authenticity of the next stage before handing over execution.
>
> In addition to ensuring that devices are running a safe version of Android, Verified Boot check for the correct version of Android with rollback protection. Rollback protection helps to prevent a possible exploit from becoming persistent by ensuring devices only update to newer versions of Android.
>
> In addition to verifying the OS, Verified Boot also allows Android devices to communicate their state of integrity to the user.

https://source.android.com/security/verifiedboot.

36. In particular, each LG G5 contains both erasable, non-volatile memory in the form of ROM and volatile memory in the form of RAM.

37. Further, each LG G5 was configured by LGE to perform the below described process (or one substantially like it) in order to install an OTA update:



## Life of an OTA update

A typical OTA update contains the following steps:

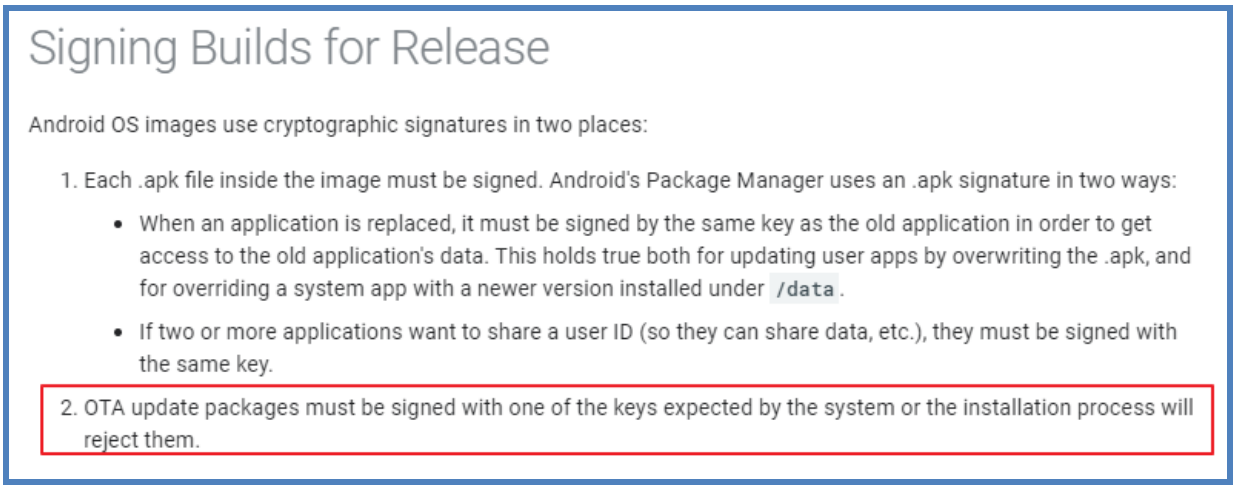
1. Device performs regular check in with OTA servers and is notified of the availability of an update, including the URL of the update package and a description string to show the user.
2. Update downloads to a cache or data partition, and its cryptographic signature is verified against the certificates in `/system/etc/security/otacerts.zip`. User is prompted to install the update.
3. Device reboots into recovery mode, in which the kernel and system in the recovery partition are booted instead of the kernel in the boot partition.
4. Recovery binary is started by init. It finds command-line arguments in `/cache/recovery/command` that point it to the downloaded package.
5. Recovery verifies the cryptographic signature of the package against the public keys in `/res/keys` (part of the RAM disk contained in the recovery partition).
6. Data is pulled from the package and used to update the boot, system, and/or vendor partitions as necessary. One of the new files left on the system partition contains the contents of the new recovery partition.
7. Device reboots normally.
    a. The newly updated boot partition is loaded, and it mounts and starts executing binaries in the newly updated system partition.
    b. As part of normal startup, the system checks the contents of the recovery partition against the desired contents (which were previously stored as a file in `/system`). They are different, so the recovery partition is reflashed with the desired contents. (On subsequent boots, the recovery partition already contains the new contents, so no reflash is necessary.)

The system update is complete! The update logs can be found in `/cache/recovery/last_log.#`.

https://source.android.com/devices/tech/ota/nonab.

38. During this process, a program running on one or more OTA servers owned and/or controlled by LGE sets up a verification structure in the erasable, non-volatile memory of the BIOS of an LG G5 by transmitting to the device an OTA update, which the LG G5 is configured by LGE to thereafter save to a cache or data partition of the erasable, non-volatile memory of its BIOS.

39. This OTA update contains a verification structure that include data accommodating at least one license record. Examples of such a license record include a cryptographic signature or key:



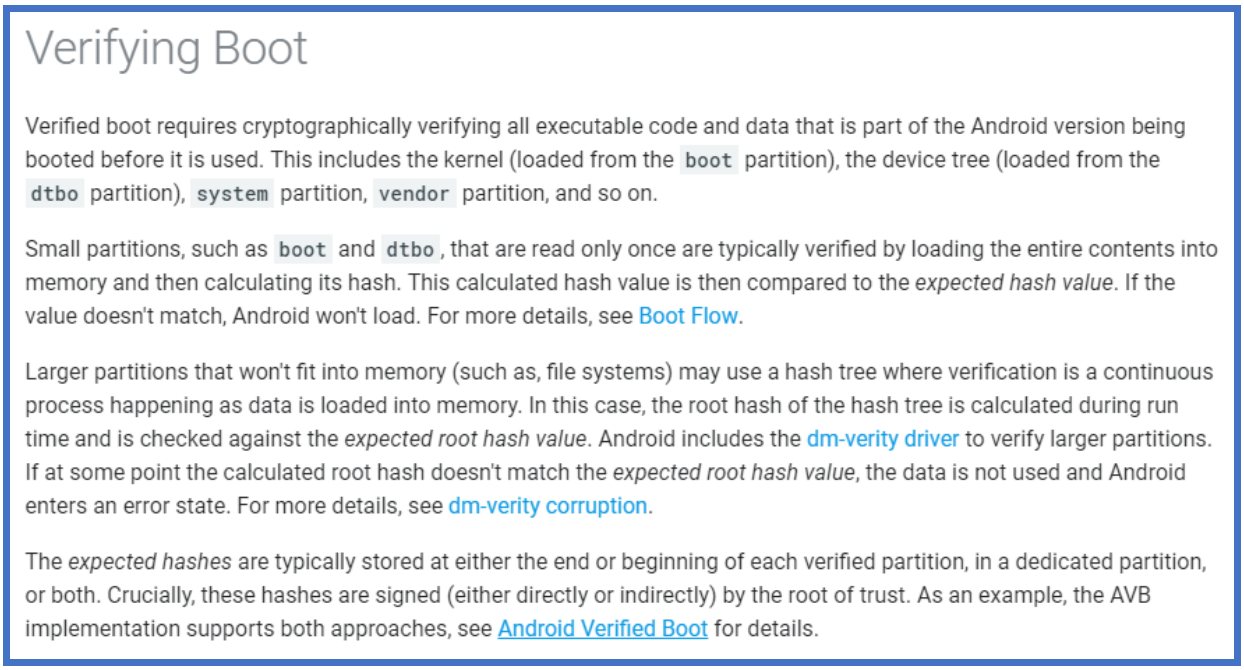
## Signing Builds for Release

Android OS images use cryptographic signatures in two places:

1. Each .apk file inside the image must be signed. Android's Package Manager uses an .apk signature in two ways:
   - When an application is replaced, it must be signed by the same key as the old application in order to get access to the old application's data. This holds true both for updating user apps by overwriting the .apk, and for overriding a system app with a newer version installed under `/data`.
   - If two or more applications want to share a user ID (so they can share data, etc.), they must be signed with the same key.
2. OTA update packages must be signed with one of the keys expected by the system or the installation process will reject them.

https://source.android.com/devices/tech/ota/sign_builds.

40. Such license record also may comprise a cryptographic hash or hash tree:



## Verifying Boot

Verified boot requires cryptographically verifying all executable code and data that is part of the Android version being booted before it is used. This includes the kernel (loaded from the `boot` partition), the device tree (loaded from the `dtbo` partition), `system` partition, `vendor` partition, and so on.

Small partitions, such as `boot` and `dtbo`, that are read only once are typically verified by loading the entire contents into memory and then calculating its hash. This calculated hash value is then compared to the *expected hash value*. If the value doesn't match, Android won't load. For more details, see Boot Flow.

Larger partitions that won't fit into memory (such as, file systems) may use a hash tree where verification is a continuous process happening as data is loaded into memory. In this case, the root hash of the hash tree is calculated during run time and is checked against the *expected root hash value*. Android includes the dm-verity driver to verify larger partitions. If at some point the calculated root hash doesn't match the *expected root hash value*, the data is not used and Android enters an error state. For more details, see dm-verity corruption.

The *expected hashes* are typically stored at either the end or beginning of each verified partition, in a dedicated partition, or both. Crucially, these hashes are signed (either directly or indirectly) by the root of trust. As an example, the AVB implementation supports both approaches, see Android Verified Boot for details.

https://source.android.com/security/verifiedboot/verified-boot.

41. Once the verification structure has been set up in the BIOS, the LG G5 is configured by LGE to reboot into recovery mode, load the OTA update into its volatile memory (e.g., RAM), and use the at least one license record from the BIOS to verify the OTA update.

42. If the OTA update is verified, the LG G5 is further configured to load and execute the update.

43. In sum, as described above, once LGE has set up the verification structure by transmitting to a device an OTA update like those LGE provided on or about November 21, 2016, November 29, 2016, November 30, 2016, February 20, 2017, and May 17, 2017, each Accused Product is configured to automatically perform each of the remaining Claim 1 steps.

44. Further, on information and belief, when LGE provided an OTA update like those LGE provided on or about November 21, 2016, November 29, 2016, November 30, 2016, February 20, 2017, and May 17, 2017, LGE performed or caused to be performed each of the Claim 1 steps.

45. Further, LGE conditions participation in the OTA update process and the receipt of the benefit of a software update on the performance of each of the above steps.

46. Primarily, as described above, LGE pre-configures/programs each Accused Product to perform the above described steps upon receiving an OTA update from LGE.

47. Further, LGE takes steps to ensure that each Accused Product cannot install an OTA update except by performing each of the above described steps.

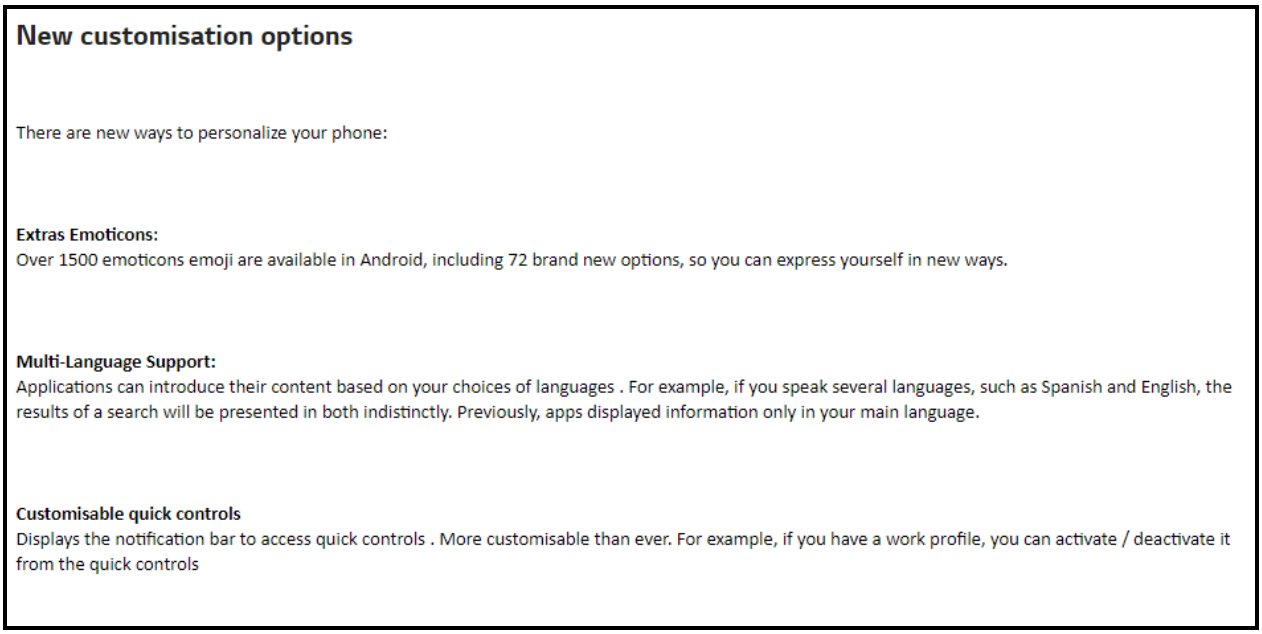
48. For example, LGE precludes third parties from altering an Accused Product to allow it to install such updates in a different manner, including by stating in its Manufacturer's Warranty that potential damage from "unauthorized modifications" or "alterations" will not be within the scope of the warranty. https://www.lg.com/us/mobile-phones/arbitration/legalterms.

49. Further, LGE emphasizes the benefits associated with updating the software of its Accused Products.

50. For example, LGE has stated that updating products' software with newer versions will "improve their operations or add new features" and has emphasized to consumers that "makes

sure that your product always has the most up-to-date software version that does not compromise its performance." https://www.lg.com/uk/support/solutions/audio-video/software-update.

51. LGE also identified specific benefits associated with updating an LG G5 to Android 7.0—the update that LGE released to such devices in the United States on or about November 21, 2016, November 29, 2016, November 30, 2016, February 20, 2017, and May 17, 2017—including "New customization options," "Improved Productivity," "More battery saving," "Better graphics and support virtual reality," and "High level security":



**New customisation options**

There are new ways to personalize your phone:

**Extras Emoticons:**
Over 1500 emoticons emoji are available in Android, including 72 brand new options, so you can express yourself in new ways.

**Multi-Language Support:**
Applications can introduce their content based on your choices of languages . For example, if you speak several languages, such as Spanish and English, the results of a search will be presented in both indistinctly. Previously, apps displayed information only in your main language.

**Customisable quick controls**
Displays the notification bar to access quick controls . More customisable than ever. For example, if you have a work profile, you can activate / deactivate it from the quick controls

## Improved Productivity

Whether you're answering work emails, and making plans with friends, Android Nougat will make things easier with its new multitasking feature :

**Fast switching between applications:**

A double-click on the recent applications button (square) will switch you to the previous application.

**Multi-window or split window:**
You can see 2 applications at the same time. Resize the windows then drag and drop them to areas of the screen. Press the square button in applications compatible with multi-window will see an icon. Click on it. After that choose another application for the lower part of the screen.

**Direct response:**

Respond directly to a notification without opening the application.

## More battery saving

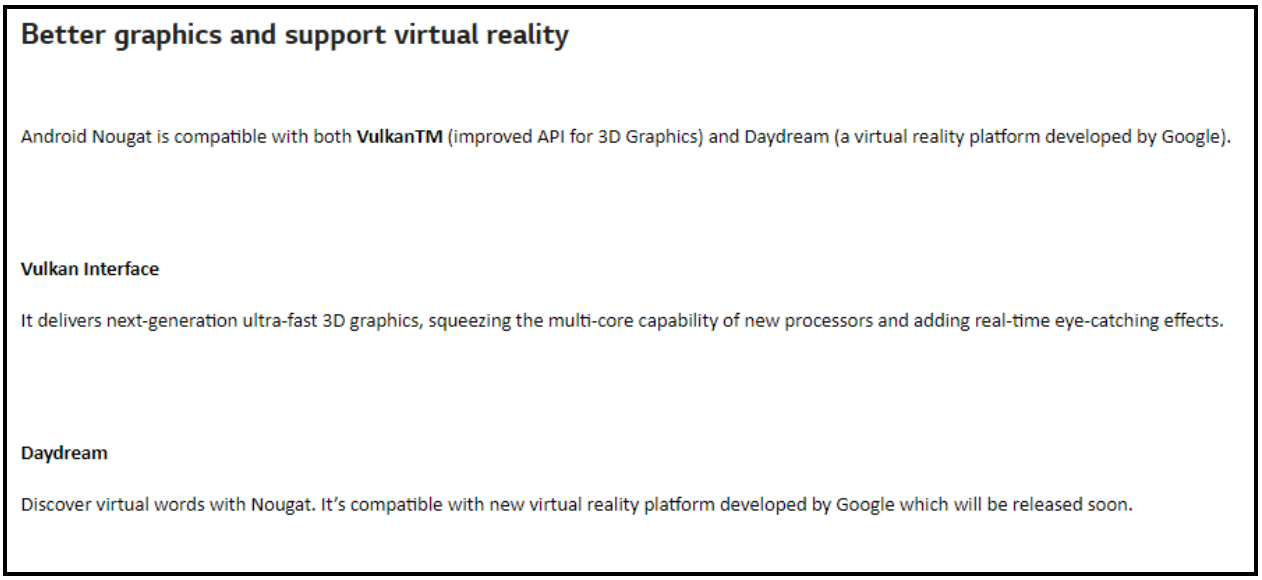
Energy management has become even more advanced and intelligent. Doze technology (released in Android Marshmallow) becomes smarter and more powerful.

**Svelte**

This is the denomination of a project that dates back to the previous Android versions. With Android Nougat it showsit's full potential. Applications in the background will have lower priority when it comes to the RAM and CPU usage. It will lead to a prolongation of battery life.

**Twelve Mode**

The best thing about Doze energy saving mode is that many people have not noticed its existence. This is how well it works. It puts your smartphone into a semi-lethargic mode, reducing CPU usage to a minimum and running only truly important things. In Android Nougat, this mode was slightly improved. Now Doze detects whether you use your mobile phone while moving or it just lies in your pocket.



## Better graphics and support virtual reality

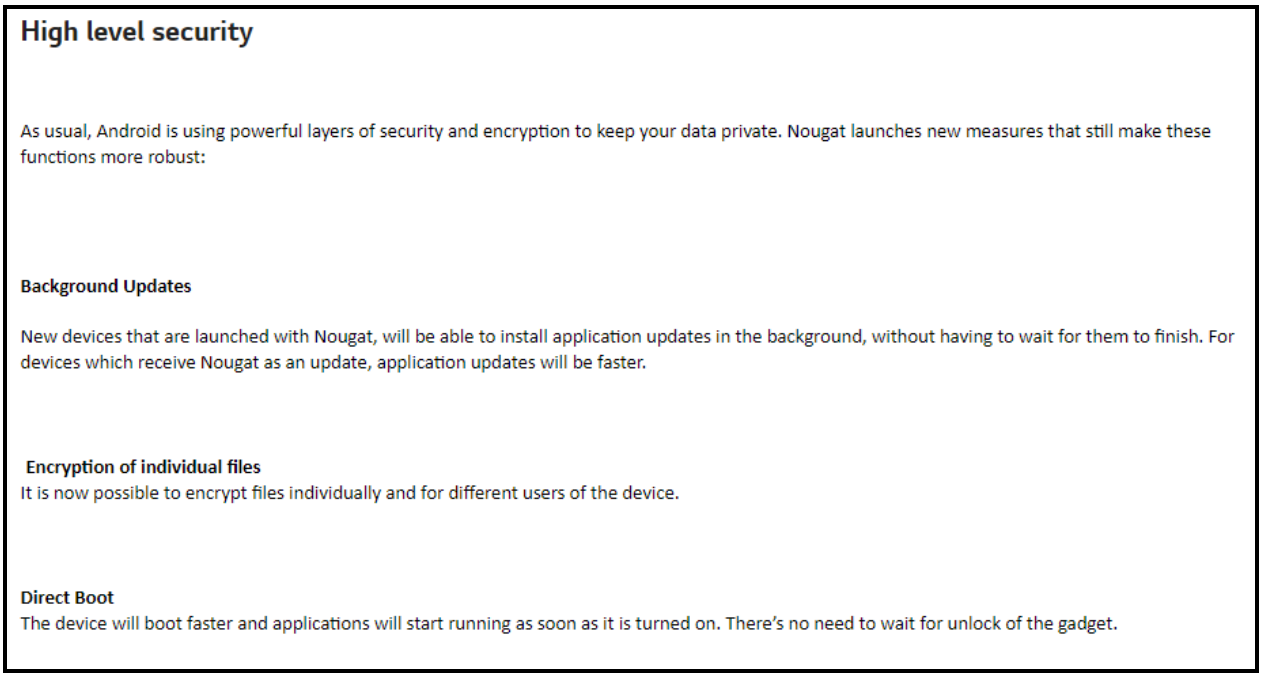
Android Nougat is compatible with both **VulkanTM** (improved API for 3D Graphics) and Daydream (a virtual reality platform developed by Google).

**Vulkan Interface**

It delivers next-generation ultra-fast 3D graphics, squeezing the multi-core capability of new processors and adding real-time eye-catching effects.

**Daydream**

Discover virtual words with Nougat. It's compatible with new virtual reality platform developed by Google which will be released soon.



## High level security

As usual, Android is using powerful layers of security and encryption to keep your data private. Nougat launches new measures that still make these functions more robust:

**Background Updates**

New devices that are launched with Nougat, will be able to install application updates in the background, without having to wait for them to finish. For devices which receive Nougat as an update, application updates will be faster.

**Encryption of individual files**
It is now possible to encrypt files individually and for different users of the device.

**Direct Boot**
The device will boot faster and applications will start running as soon as it is turned on. There's no need to wait for unlock of the gadget.

https://www.lg.com/uk/support/solusions/mobile/android-7-nougat.

52. LGE has made similar statements emphasizing the benefit of performing other OTA updates.

53. Further, LGE controlled the manner of the performance of such method. As set forth above, LGE configured each Accused Product such that, upon receiving an OTA update, it would automatically perform each remaining step of the claimed method.

54. LGE also controlled the timing of the performance of such method by determining when to utilize its OTA servers/software to set up a verification structure in each Accused Product.

55. LGE also had the right and ability to stop or limit infringement simply by not performing the initial step of using its OTA servers/software to set up a verification structure in each Accused Product. Absent this action by LGE, the infringement at issue would not have occurred.

56. LGE's infringement has caused damage to Ancora, and Ancora is entitled to recover from LGE those damages Ancora has sustained as a result of LGE's infringement.

## DEMAND FOR JURY TRIAL

57. Plaintiff hereby demands a jury trial for all issues so triable.

## PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for judgment as follows:

A. Declaring that LG Electronics Inc. and LG Electronics U.S.A., Inc. have infringed United States Patent No. 6,411,941 in violation of 35 U.S.C. § 271;

B. Awarding damages to Ancora arising out of this infringement, including enhanced damages pursuant to 35 U.S.C. § 284 and prejudgment and post-judgment interest, in an amount according to proof;

C. Awarding such other costs and relief the Court deems just and proper, including any relief that the Court may deem appropriate under 35 U.S.C. § 285.

Date: June 21, 2019.

Respectfully submitted,

By: */s/ Charles Ainsworth*

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Robert Christopher Bunt
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